

3.3 Prove Lines are Parallel

Postulate 16

Corresponding Angle ConverseIf corresponding \angle s are \cong , then the lines are \parallel .

Theorem 3.4

Alternate Interior Angle ConverseIf alternate interior \angle s are \cong , then the lines are \parallel .

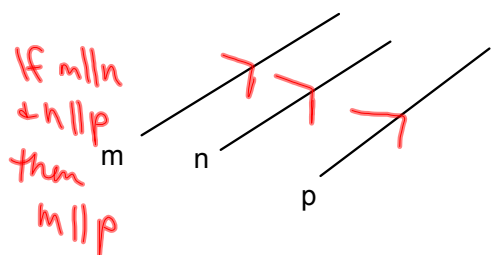
Theorem 3.5

Alternate Exterior Angle ConverseIf alternate exterior \angle s are \cong , then the lines are \parallel .

Theorem 3.6

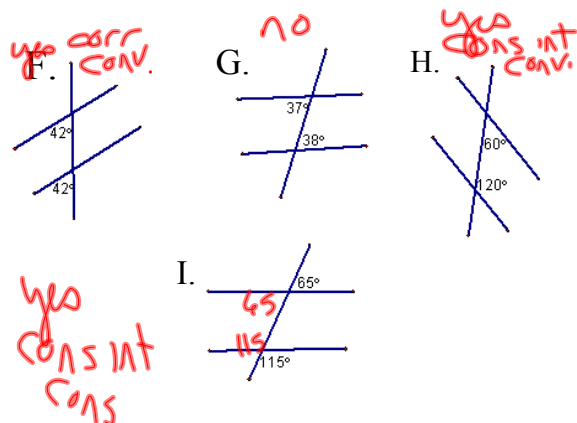
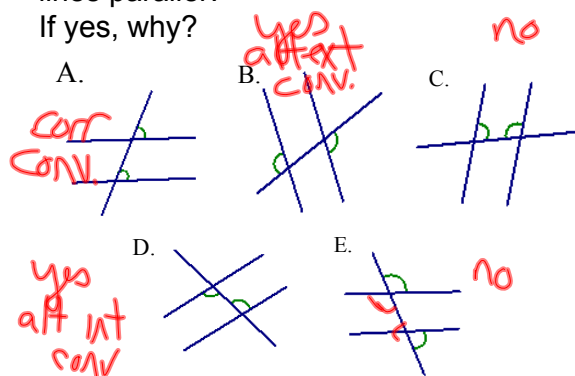
Consecutive Interior Angle ConverseIf same-side interior \angle s are supplementary, then the lines are \parallel .

Theorem 3.7--Transitive Property of Parallel lines--If 2 lines are parallel to the same line, then they are parallel to each other

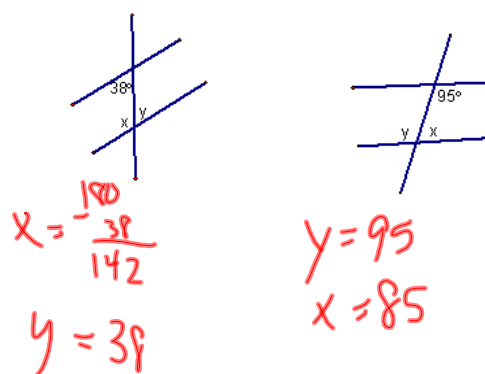


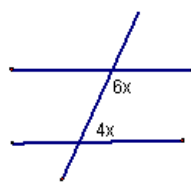
Is there enough information to prove the lines parallel?

If yes, why?



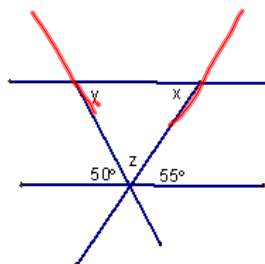
Find the value for x and y, so that the lines are parallel.





$$10x = 180$$

$$x = 18$$



$$x = 55$$

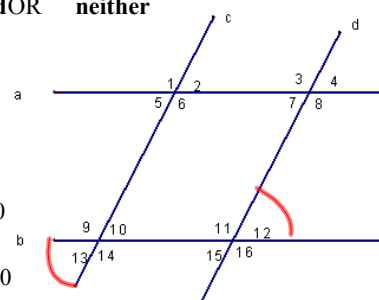
$$y = 50$$

$$z = 75$$

Which lines are parallel based on the given information?

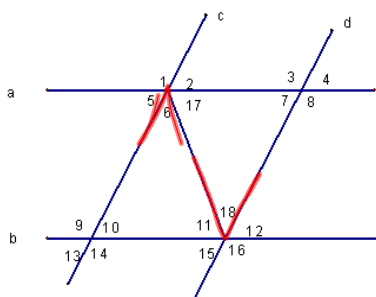
a and b OR c and d OR neither

1. $\angle 1 \cong \angle 9$
2. $\angle 13 \cong \angle 15$
3. $\angle 7 \cong \angle 12$
4. $\angle 3 \cong \angle 16$
5. $\angle 1 \cong \angle 16$
6. $m\angle 8 + m\angle 12 = 180$
7. $m\angle 2 + m\angle 3 = 180$
8. $m\angle 10 + m\angle 15 = 180$
9. $\angle 13 \cong \angle 12$
10. $\angle 1 \cong \angle 6$



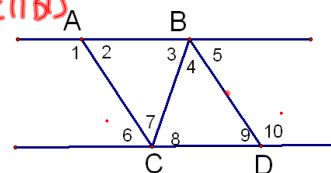
11. $\angle 11 \cong \angle 17$

12. $\angle 18 \cong \angle 6$

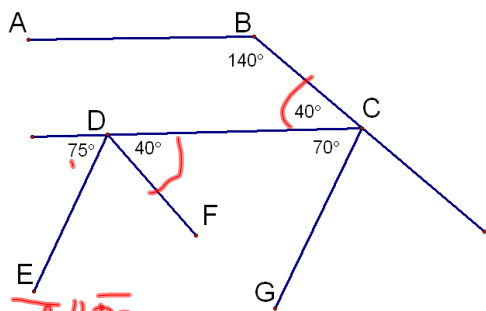


$\uparrow \overline{AB} \parallel \overline{CD}$ $\downarrow \overline{AC} \parallel \overline{BD}$

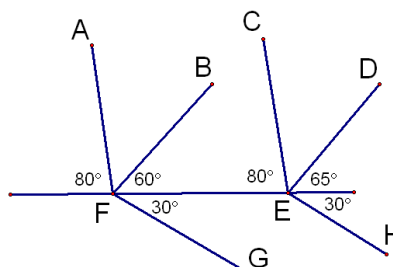
Which lines, if any, are parallel?



1. $\angle 2 \cong \angle 6$
2. $\angle 2 \cong \angle 5$
3. $m\angle 2 + m\angle ABD = 180$
4. $\angle 3 \cong \angle 8$
5. $\angle 4 \cong \angle 7$
6. $\angle 10 \cong \angle 6$



$\overline{AB} \parallel \overline{DC}$ const int conv
 $\overline{BC} \parallel \overline{DF}$ alt int conv



$\overline{AF} \parallel \overline{CE}$ corr conv
 $\overline{BE} \parallel \overline{DH}$ corr conv

Ex 1

Given: $\angle 1 \cong \angle 2$
Prove: $\angle 4 \cong \angle 3$

S.	R.
① $\angle 1 \cong \angle 2$	① Given
② $n \parallel m$	② Corr \angle Conv.
③ $\angle 4 \cong \angle 3$	③ $p \parallel q$, Corr \angle \cong (Corr \angle thm)

Ex 2:

Given: $\angle 4 \cong \angle 7$
Prove: $r \parallel s$

S.	R.
① $\angle 4 \cong \angle 7$	① Given
② $\angle 4 + \angle 6$ are suppl.	② Cons. Int \angle s thm
③ $m\angle 4 + m\angle 6 = 180$	③ Def of suppl.
④ $m\angle 4 = m\angle 7$	④ Def of \cong
⑤ $m\angle 7 + m\angle 6 = 180$	⑤ Subst.
⑥ $\angle 7 + \angle 6$ are suppl.	⑥ Def of suppl.
⑦ $r \parallel s$	⑦ Cons Int \angle s Conv.

HW

p165-168

10-15, 17, 19-21, 26-28, 34

